

What is claimed is:

1. An implant system for promoting fusion bone growth in the space between adjacent vertebrae including at least first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members comprising:

opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae,

said central element being sized smaller relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces,

at least said first load bearing member including at least one opposite end piece having a truncated surface configured to nest within said second load bearing member.

2. The implant system of claim 1, wherein said opposite end pieces include a first end piece and a second end piece, said first end piece including a truncated surface and having a first dimension between said two opposite surfaces and a second dimension transverse to said first dimension, said first dimension being greater than said second dimension, said first dimension being sized to maintain the space between adjacent vertebrae.

3. The implant system of claim 2, wherein said second end piece of said load bearing members includes truncated non-circular surfaces between said two opposite surfaces.

4. The implant system of claim 3, wherein said truncated non-circular surfaces are substantially flat.

5. The implant system of claim 4, wherein said first end piece of said load bearing members has an arcuate surface.

6. The implant system of claim 5, wherein each of said two opposing surfaces of said second end piece has an arcuate surface.

7. The implant system of claim 6, wherein said first end piece of said second load bearing member is substantially cylindrical and is nested within said first end piece of said first load bearing member.

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8. The implant system of claim 7, wherein said first end piece of said second load bearing member includes a truncated surface.

9. The implant system of claim 1, wherein said truncated surface is concave.

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10. The implant system of claim 1, further comprising an osteogenic material contained within each of said pocket of each of said load bearing members and arranged to contact the adjacent vertebrae when the vertebrae are supported by said opposite end pieces.

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11. The implant system of claim 10, wherein said osteogenic material includes an osteogenic substance disposed within a carrier.

12. The implant system of claim 11, wherein said carrier is a collagen sheet wound around said central elements within each of said pocket of said load bearing members.

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13. The implant system of claim 11, wherein said osteogenic substance is a bone morphogenetic protein.

14. The implant system of claim 11, wherein said two opposite surfaces of at least one of said end pieces includes threads.

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15. The implant of claim 1, wherein said truncated surface is defined by a cutout region formed in said at least one opposite end piece having said truncated surface.

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16. An implant system for promoting fusion bone growth in the space between adjacent vertebrae, said implant system comprising:

at least two implants adapted to be bilaterally placed between adjacent vertebrae, each of said implants including opposite end pieces, said implants sized for introduction into said space between adjacent vertebrae, said implants configured to be nested

together and to create a pocket between the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, the pocket configured to contain an osteogenic material for promoting unshielded bone growth between the adjacent vertebrae in said pocket.

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17. The system of claim 16, wherein:

said implants include a first implant and a second implant,

said opposite end pieces of said first implant each have a male member;

said opposite end pieces of said second implant each define a female member; and

10 said male and female members interlock with one another to resist lateral separation of said first and second implants.

18. A method of promoting fusion bone growth in the space between adjacent vertebrae, said method comprising:

15 implanting into said space between adjacent vertebrae at least two implants sized for introduction into said intervertebral space, each of said implants including opposite end pieces, said implants configured to be nested together and to create a pocket between the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, the pocket configured to contain an osteogenic material for promoting unshielded bone growth  
20 between the adjacent vertebrae.

19. The method of claim 18, wherein said implants are nested together.

20. A method of promoting fusion bone growth in the space between adjacent  
25 vertebrae, said method comprising:

(a) providing an implant including an elongated central body sized for introduction into the space between adjacent vertebrae, said body having opposite end pieces, at least one of said opposite end pieces including a truncated surface having opposite faces defining an entrance to a cutout region, said cutout region defined by said truncated surface;

30 a bone growth inductive material disposed around said central body and positioned to provide intimate contact with the adjacent vertebrae when said central body is within the space between adjacent vertebrae;

(b) preparing said adjacent vertebrae to receive said implant in an intervertebral space between adjacent vertebrae; and

(c) placing said implant into the intervertebral space after said preparing step.

21. An implant system for promoting fusion bone growth in the space between adjacent vertebrae comprising at least first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, a first of said load bearing members including a male member, and a second of said load bearing members including a female member, said male and female members cooperating to resist lateral separation of said devices.

22. The system of claim 21, wherein said load bearing members are generally cylindrical in shape.

23. The system of claim 21, wherein at least one of said load bearing members includes an outer surface configured to resist expulsion of said load bearing member from the space.

24. The system of claim 21, wherein said load bearing members each include: opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae, said central element being sized relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces, said first load bearing member including at least one opposite end piece having said male member; and said second load bearing member including at least one opposite end piece having said female member.

25. The system of claim 21, wherein said end pieces are generally cylindrical in shape.

26. The system of claim 21, wherein each end piece of said first load bearing member includes a male member, and each end piece of said second load bearing member includes a female member.

5           27. The system of claim 21, wherein said first and second load bearing members each include an end piece having a male member and an end piece having a female member.

28. The system of claim 21, wherein said first and second load bearing members are configured to nest with one another.

10           29. The system of claim 21, wherein said male and female members are engageable by moving said first and second devices axially relative to one another.

30. A method of promoting fusion bone growth in the space between adjacent  
15   vertebrae, said method comprising:

(a) providing an implant system including first and second load bearing members adapted to be bilaterally placed between adjacent vertebrae, said load bearing members including:

20           opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae,

25           said central element being sized relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material disposed about said central element and in intimate contact with the adjacent vertebrae when the vertebrae are supported by said opposite end pieces,

            at least said first load bearing member including at least one opposite end piece having a truncated surface configured to nest within said second load bearing member;

30           a bone growth inductive material disposed around said central body and in intimate contact with the adjacent vertebrae when said central body is within the space between adjacent vertebrae;

(b) preparing said adjacent vertebrae to receive said implant in an intervertebral space between adjacent vertebrae; and

(c) placing said implant into the intervertebral space after said preparing step.

31. An implant system, comprising:

an insertion tool; and

an implant attached to said insertion tool, said implant for promoting fusion bone growth in an intervertebral disc space between adjacent vertebrae and comprising a load bearing member including opposite end pieces and an elongated central element extending between said end pieces, said opposite end pieces having two opposite surfaces configured to contact and support the adjacent vertebrae, said opposite end pieces sized to maintain the space between the adjacent vertebrae, said central element being sized relative to said opposite end pieces to define a pocket between said central element and the adjacent vertebrae when the adjacent vertebrae are supported by said opposite end pieces, said pocket configured to contain an osteogenic material.

32. An implant system for promoting fusion bone growth in a space between adjacent vertebrae, comprising:

a first osteogenic fusion device including a first end piece, a second end piece, and a central element, said central element of said first fusion device extending between said first end piece of said first fusion device and said second end piece of said first fusion device, said central element of said first fusion device having an outer diameter; wherein said first and second end piece of said first fusion device each have an outer diameter that is greater than said outer diameter of said central element of said first fusion device to minimize stress shielding along said central element of said first fusion device;

a second osteogenic fusion device including a first end piece, a second end piece, and a central element, said central element of said second fusion device extending between said first end piece of said second fusion device and said second end piece of said second fusion device; and

wherein said first end piece of said first fusion device has a cutout region defined by a truncated surface configured to nest with said first end piece of said second fusion device.

33. The system of claim 32, wherein said truncated surface has a concave shape.

34. The system of claim 33, wherein said first end piece of said second fusion device and said second end piece of said second fusion device each have a generally cylindrical shape.

5           35. The system of claim 32, wherein said second end piece of said first fusion device has a pair of opposite truncated surfaces disposed between a pair of bone contacting surfaces.

10           36. The system of claim 32, wherein said second end piece of said first fusion device has a cutout region defined by a truncated surface configured to nest with said second end piece of said second fusion device.

15           37. The system of claim 36, wherein:  
said first end piece of said second fusion device has a cutout region defined by a truncated surface; and  
said second end piece of said second fusion device has a cutout region defined by a truncated surface.

20           38. The system of claim 32, wherein:  
said second end piece of said second fusion device has a cutout region defined by a truncated surface; and  
said second end piece of said first fusion device is configured to nest within said cutout region in said second end piece of said second fusion device.

25           39. The system of claim 32, wherein:  
said first fusion device and said second fusion device are configured to resist lateral expulsion;  
said cutout region of said first end piece of said first fusion device defines an opening serving as a female member; and  
30           said first end piece of said second fusion device having a mating member sized to fit within said opening of said first fusion device to serve as a male member.

40. The system of claim 39, wherein said first end piece of said first fusion device has a stop member positioned to be contacted with said mating member of said second fusion device.

5 41. The system of claim 39, further comprising a connecting plate spanning across said first end piece of said first fusion device and said first end piece of said second fusion device.

10 42. The system of claim 32, wherein when said first fusion device and said second fusion device are nested together a pocket is created to contain osteogenic material for promoting unshielded bone growth between the adjacent vertebrae.

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